



H1 Software Tool User Guide

Quick guide 520_12

Issued 08/08/2012

What's this document about?

This document is provided to help users of the Environment Agency's H1 Software Tool, version 2.4. It reflects the content of version 2.4 and changes made to the tool during the 2011 upgrade.



Document details

Who does this apply to?

All users of the Environment Agency's H1 Software Tool version 2.4.



Related documents



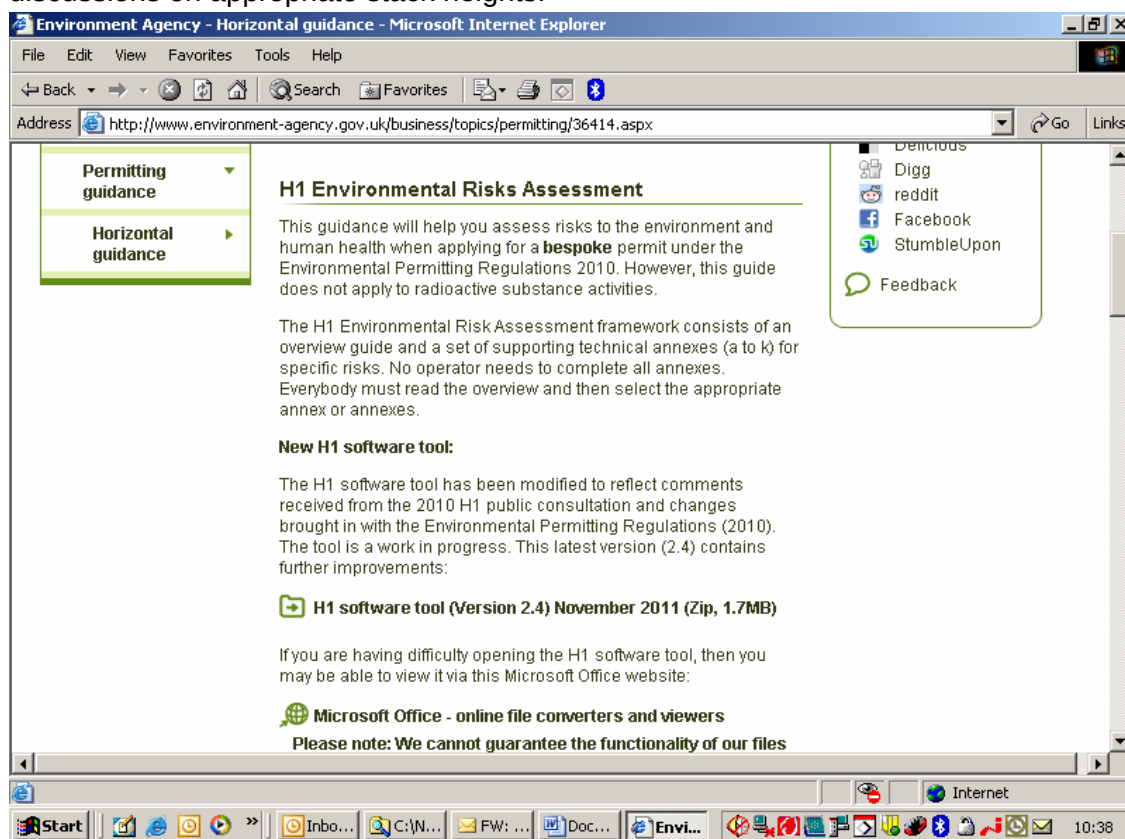
Feedback

Contact for queries

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Setting the Scene

Version 2.4 November 2011 of the tool is available to download via the Environment Agency website H1 page [see: Environment Agency - Horizontal guidance](http://www.environment-agency.gov.uk/business/topics/permitting/36414.aspx). The H1 tool enables calculation of the impact of proposed pollutant releases to various media and screens out from detailed assessment those releases described as 'insignificant'. However, for releases to air the calculation is pessimistic and should not be used to calculate a stack height to produce an insignificant environmental impact. Pre-application guidance is provided by Environment Agency area teams and this includes discussions on appropriate stack heights.



Accessing the Tool

The tool should be downloaded to the users computer hard drive, unzipped, saved and opened using Microsoft Access. The tool is based on Microsoft Access 2003 so if the user possesses a later version the link to Microsoft file converter may be required to enable the tool to open and function correctly.

Using the Tool

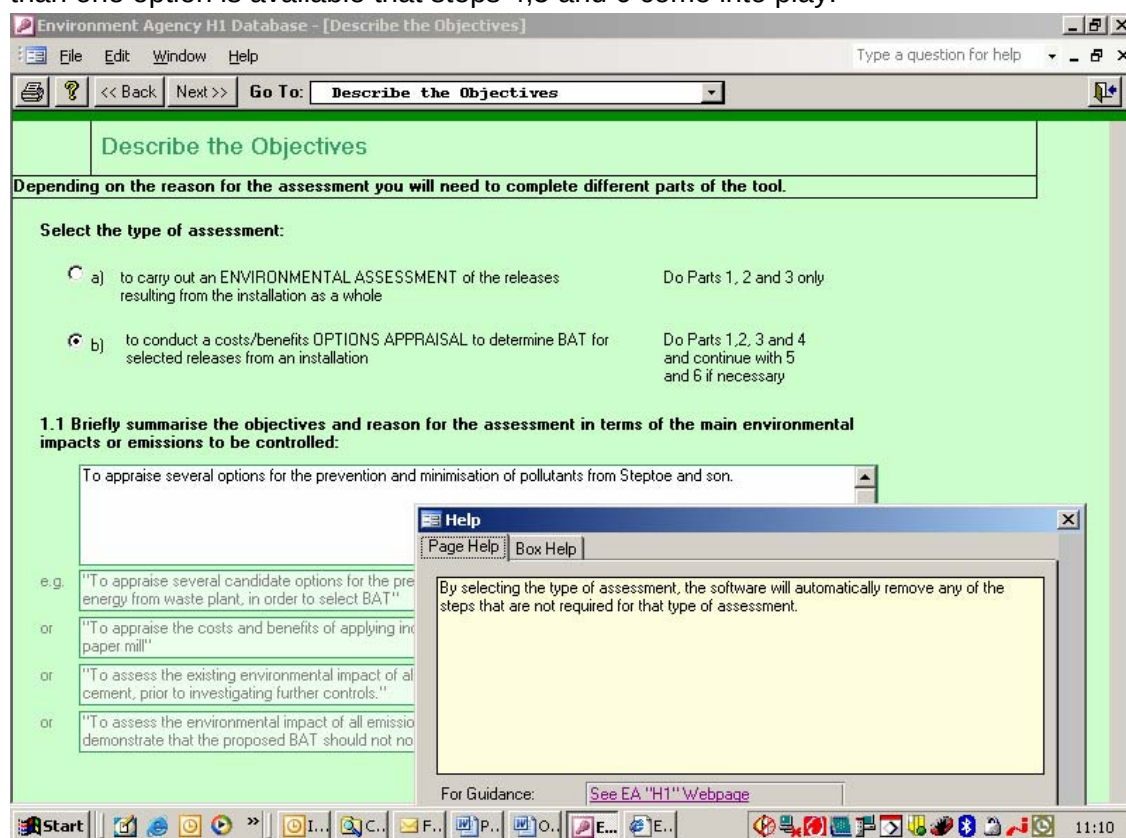
Guidance on using the tool is available at a number of locations;

- general instructions within the annex of the H1 Overview document;
- 'help' pages on each page of the tool: and
- content of this user guide.

Data entry by the user is highlighted within the tool by the use of blue cells. 'Box' help within the Help pages gives advice on the specifics of what should be entered in each blue cell. Within each 'Help' window there is a link to the Environment Agency's H1 webpage: "See EA H1 webpage". By clicking within the window a scroll bar appears which may reveal more text lower down. The Help window may be cancelled using the 'X' on the window and restored using the 'question mark' key on the top toolbar. Comment boxes are available at the bottom of each data entry page enabling the user to clarify any points they wish to make.

An 'Import utility' button on the Reference Information page is a new addition and enables the user to upload a previous tool dataset, saving the user time and energy if wanting to simply modify a previous entry, for example in support of a permit variation application.

By selecting the appropriate button in the page 'Describe the Objectives' the user is required to choose between a simple assessment or a more detailed evaluation. Called the 'Options Appraisal' this enables users to include more than one option to secure environmental protection and each option can then be ranked on the basis of costs and benefits. This enables the Best Available Technique (BAT) to be identified. Please note that whichever option is chosen steps 1,2 and 3 of the tool are the same with screening results presented graphically at the end of step 3. It is only when more than one option is available that steps 4,5 and 6 come into play.



If the Environmental Assessment button is chosen the tool moves on to 'Scope of the Environmental Assessment' and then Step 2. The first part of Step 2 is 'Air release points'.

Users may find the 'Go To' drop down menu on the top tool bar useful in navigating around the various pages of the tool. This is particularly useful when more than one option is being considered

Continues on next page

Using the Tool (continued)

Environment Agency H1 Database - [Air Release Points Option: 1 'Sewer and coast Sidmouth']

File Edit Window Help

Type a question for help

Go To: Air Release Points Option: 1

Air Release Points

Please define your Release Points for Releases to Air

Are there any Air emissions? Yes Click the Add button below

Number	Description	Location or Grid Reference	Activity or Activities	Effective Height metres	Efflux Velocity m/s	Total Flow m3/hr
e.g. A1		North stack		150	25	5,000
1	A1	North stack	Combustion	100	25	70686
2	A2	South stack	Kiln	75	12	33912

Release Points:

Add Delete Copy

Comments: Based on 1m stack diameter gives 0.785m². With 25m/s = 19.6m³/s = 70686m³/hr.
Based on 1m kiln stack diameter gives 0.785m² x 12m/s = 9.42m³/s = 33912m³/hr.

Help

Page Help Box Help

Provide a short description or code. This could follow the protocol of "A1, A2" etc. This descriptor and the location will be used to identify the release point in the subsequent pages.

Only include release points that are relevant to the option or operating scenario being assessed.

Remember to include fugitive releases if these are relevant.

This page enables release points to be added using the 'Add' button in the bottom left corner of the page. To identify the effective height of release users are referred to Annex F, and Appendix D which includes worked examples of how the effective height of release may be determined.

On the following 'Air Emissions Inventory' page for each release point users are required to enter details of long and short term pollutant concentrations and annual releases in tonnes. The tool will calculate the release rates in grammes per second once the user moves the cursor to a different cell. The annual rate is calculated by the user and entered into the cell. This allows for an operating mode of less than 100% for every hour of every day.

In entering 'water discharge locations' the user must select the 'final discharge category' to trigger the subsequent calculations and selection of the relevant Environmental Quality Standards (EQS). Freshwater locations require entry of the freshwater flowrate.

Within the 'Water Release Points' page new locations are added using the 'Add' button at the bottom left corner of the page. The user has the option to choose 'discharge to sewer' before the treated effluent reaches the relevant surface water body. Data on mean and peak effluent flow rates are required for entry here. For salt water discharges values for mean and initial dilution may be determined using the [Initial Dilution spreadsheet](#).

Continues on next page

Using the Tool (continued)

Environment Agency H1 Database - [Water Release Points Option: 1 'Sewer and coast Sidmouth']

File Edit Window Help

Type a question for help

Go To: **Water Release Points** Option: **1**

Water Release Points

Please define your Release Points for Releases to Water

Salt Water Discharges Only

Number	Description	Location or Grid Reference	Activity or Activities	Final Discharge Point	Discharge via Sewer?	Mean Effluent Flow Rate m3/s	Effluent Flow Rate (5% Exceeded)	Mean Initial Dilution	Min Initial Dilution	
e.g. W1	Discharge from ETP into River			1	No	5	10	4.000		
1	W1	STW long sea outfall	treatment	1	Coast at Sidmouth LSD	Yes	1	10	100	10
2	W2	STW short sea outfall		4	Coast at Sidmouth SSD	Yes	1	10	10	1
3	W3	Discharge at River Sid		2	River Sid	Yes	0.25	0.5	0	0

Release Points: Add Delete Copy

Comments:

For Guidance: [See EA 'H1' Webpage](#)

Start | User Guide 1.doc - Micros... | Environment Agency ... | 08:46

The 'Water Emissions Inventory' page requires data entry for long and short term pollutant concentrations for each release point. Again additional pollutants are added using the 'Add' button at the bottom left hand corner of the page.

Environment Agency H1 Database - [Water Emissions Inventory Option: 1 'Sewer and coast Sidmouth', Release Point: 1 'W1']

File Edit Window Help

Type a question for help

Go To: **Water Emissions Inventory** Release Point: **1** Option: **1**

Water Emissions Inventory

Please list all Substances released to Water for each Release Point identified in the previous page.

Which type of assessment method are you using? Continue with the method below.
(See help box & H1 Annex D for information)

Method: **Chemical Specific**

Reference:

Number	Substance	Meas'tment Method	Operating Mode (if relevant)	Data relating to Long Term effects (EQS - Annual Averages)		Data relating to Short Term effects (EQS - Max Allowable Conc.)		Annual Rate kg/yr	Sewage Treatment Factor	Benchmark Conc. mg/l
				Conc. mg/l	Meas'tment Basis	Conc. mg/l	Meas'tment Basis			
e.g.	chromium	Estimated*	continuous	0.20	annual avg	0.20	15 minute	380	1	250
1	Arsenic	Continuor	100%	0.1	Annual Avg	0.2		0.002	0.1	
2	Copper (Water	Periodic*	100%	0.05	Annual Avg	0.15		0.54	1	
3	Cadmium and i	Continuor	100%		Annual Avg			0.003	1	
4	Chromium III (S	Continuor	100%		Annual Avg			0.392	1	
5	Iron	Continuor	100%		Annual Avg			4.599	1	
6	Lead and it's c	Continuor	100%		Annual Avg			6.899	1	
7	Mercury and it	Continuor	100%		Annual Avg			0.0003	1	
8	Nickel and its	Continuor	100%		Annual Avg			1.137	1	
9	Zinc (Water H.	Continuor	100%		Annual Avg			0.65	1	

Substances: Add Delete Copy

Comments:

Start | User Guide 1.doc - ... | Environment Age... | 13:39

Continues on next page

Using the Tool (continued)

The 'annual rate' is calculated by the user and entered in the appropriate field. The 'sewage treatment factor' for individual pollutants may be obtained from Annex D, Appendix B.

'Water temperature' and 'Water pH' are available for the user to demonstrate the proposed impact of their discharge on surface fresh waters.

Data entry for pages on 'Energy Consumption', 'Raw Materials' and 'Waste Inventory' can be made using the 'Add' button in the bottom left corner of the page. Taken together with data on annual releases, calculations can be made in terms of the performance of the proposal. The output for these entries are presented in the page 'Performance Indicators' at the end of Step 2.

Raw material use, energy consumption and Waste Inventory data may be entered at the end of Step 2 to enable comparison between options later on.

In Step 3 within the 'Impacts Page' for air and water the Process Contribution (PC) for each pollutant are presented for each option. Note that where the same pollutant is released from different release points within a chosen option their contributions are added. Using assessment criteria in Annex D (surface water) and Annex F (air) screening of releases is then undertaken and screened-out releases are deleted from further calculation. Pollutant releases which are not screened out are carried forward to the 2nd stage where the user is required to insert pollutant background concentrations which enables the resulting Predicted Environmental Concentration (PEC) to be compared to the EAL/EQS.

Water Impact Screening

Significant Emissions to Water

The Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be further assessment as they are likely to have an insignificant impact.

Emission	Long Term EQS µg/l	Short Term MAC µg/l	Long Term			Short Term		
			PC µg/l	% PC of EQS %	> 4% of EQS?	PC µg/l	% PC of MAC %	> 4% of MAC?
and its compounds (water hardness class 1) (Tham)	0.2	0.44	0.01	3.33	No	0.03	6.82	Yes
and its compounds (water hardness class 1) (River)	0.07	0.44	0.00	4.73	Yes	0.02	4.49	Yes
and its compounds (water hardness class 1) (Tham)	0.2	0.44	0.01	2.50	No	0.02	4.55	Yes
and its compounds (water hardness class 3) (Tham)	0.2	0.6	0.01	2.50	No	0.02	3.34	No
and its compounds (water hardness class 3) (Tham)	0.2	0.6	0.01	3.33	No	0.03	5.00	Yes
and its compounds (water hardness class 3) (River)	0.09	0.6	0.00	3.68	No	0.02	3.29	No
and its compounds (water hardness class 5) (Tham)	0.2	1.5	0.01	3.33	No	0.03	2.00	No
and its compounds (water hardness class 5) (River)	0.25	1.5	0.00	1.32	No	0.02	1.32	No
and its compounds (water hardness class 5) (Tham)	0.2	1.5	0.01	2.50	No	0.02	1.34	No

Through a recent modification Step 3 includes the option to assess the impact of visible plumes produced by operation of the activity.

Continues on next page

Using the Tool (continued)

Environment Agency H1 Database - [Visual Impacts Option: 1 'Base-Case', Release Point: 2 'A2']

File Edit Window Help

Type a question for help

Go To: Visual Impacts Release Point 2 Option 1

Visual Impacts

Assess the visual impacts of plumes generated from the release points

Can ANY of the Options generate a visible plume? Yes

Can any of the release points generate a Visible Plume? Yes

For what % of daylight hours per year does the Plume extend beyond the installation boundary? 5%-25%

Refer to the guidance in Annex A and assign a level of significance: Medium

Provide any supporting evidence below

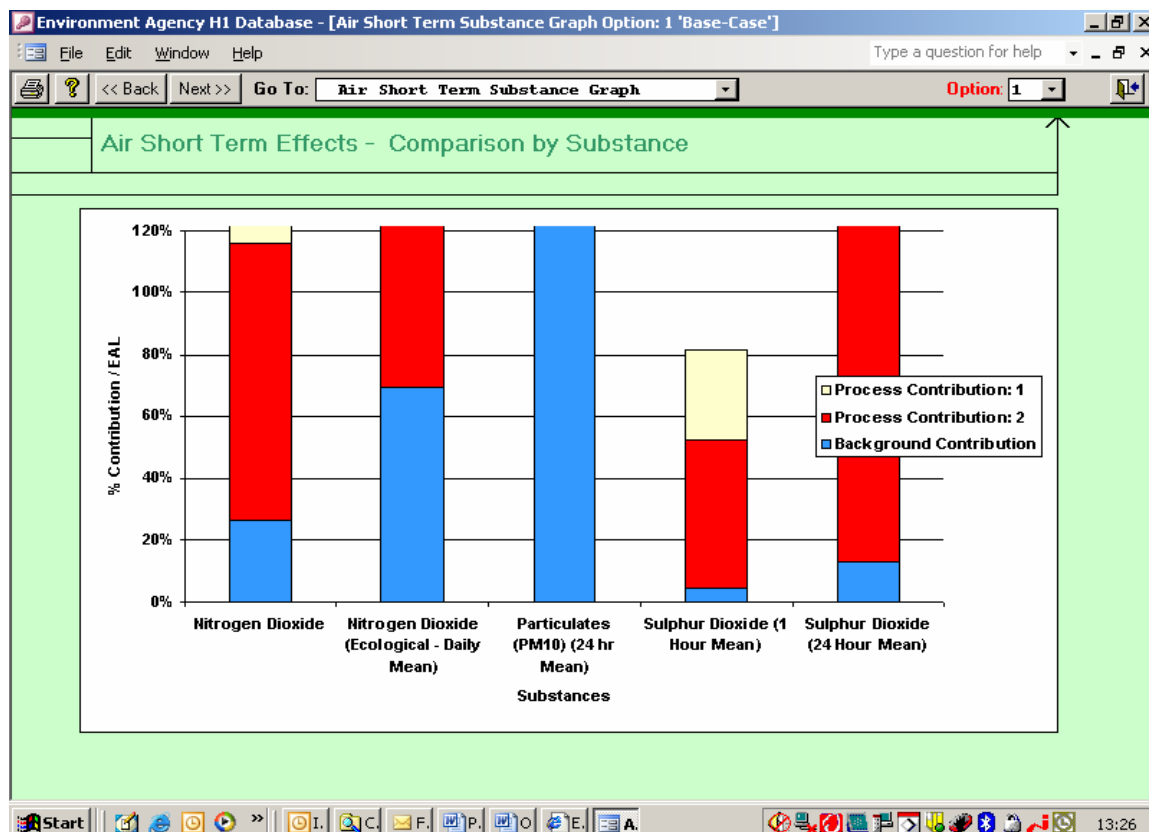
Help

Page Help Box Help

On this page you should make an assessment of the visual impact of any plumes resulting from the emissions from your activities. Note that the only visible substance permitted should be condensed water vapour.

For Guidance: See EA 'H1' Webpage

Step 3 also includes comparison of the 'Photochemical Ozone Creation Impacts' where annual releases of relevant substances are compiled enabling comparison between options. Similarly, carbon dioxide releases are also compiled for each option enabling comparison within the 'Global Warming Potential Impacts' page. Also, the Waste Impacts score is calculated for each option enabling comparison between options later in the tool. At the end of Step 3 'Summary Tables' are available for selection and printing summarising results of data input and impacts. Step 3 is completed by the 'Graphical Results' section.



Selecting the 'Options Appraisal' button requires the user to identify the candidate options for achieving the required environmental outcome. The 1st option may be described as 'Base Case' with subsequent options individually identified. Additional options are added using the 'Add' button in the 'Options' field at the base of the page.

Environment Agency H1 Database - [Candidate Options]

File Edit Window Help

Go To: **Candidate Options**

Describe the Candidate Options

Identify all reasonably applicable options of techniques

You should include:

- a brief description of individual control measures or configurations of control measures selected are associated (the existing base-case may conveniently be the first option).
- justification why any techniques generally applicable to the regulated facility have not been selected (This should be based on regulated facility-specific technical, not economic reasons).
- for new projects, whether any initial environmental assessment that was done at the project or process routes prior to this assessment, particularly where this has a bearing on environmental performance.

In the case of b) or c) please enter your Comments here:

Option Number Title Description

e.g.

1	Base-Case	Basic SO ₂ , NO _x and PM ₁₀ abatement.
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Once a series of options have been generated for the proposed project, it is recommended that the Operator discuss these with the local Regulator to check both parties agree that the options are satisfactory. This may save the Operator from spending resources on assessment of options which are unlikely to meet the required environmental performance.

List the main activity or activities to which the release control option Number:1 (Base-Case) is/are applicable and any other activities that will be affected by the candidate control option on the main activity.

Options:

Add Delete

Activity Details

Help

Page Help Box Help

This page will only be displayed if you are doing an options appraisal.

For Guidance: [See EA "H1" Webpage](#)

Step 4 requires the user to identify the option with the lowest predicted environmental impact and asks the user to resolve any cross-media impacts. Options are ranked in terms of their environmental performance.

Environment Agency H1 Database - [Option Ranking]

File Edit Window Help

Go To: **Option Ranking**

GWP: [] []

Disposal of Waste: [] []

Provide a description of how cross media conflicts have been resolved:

This will require reasoned judgement, with reference to any decisions or assumptions made over the relative importance of different environmental impacts. See H1 for requirements, guidelines and examples to assist in the process. You may submit this information separately.

Location or reference to information on resolution of cross media conflicts:

Present a summary of the final ranking of options in the table below:

Number	Title	Ranking
1	Base-Case	1
2	Improved 1	2
3	Improved 2	3
4	Improved 3	4

Continues on next page

Candidate Options (Continued)

Step 5 is used to identify the costs associated with the implementation of each option. Capital and Investment Costs data and Operating Costs data are combined in calculation of the total costs.

Environment Agency H1 Database - [Cost Totals Option: 1 'Base-Case']

File Edit Window Help

Type a question for help

Go To: **Cost Totals** Option: **1**

Calculate Total Costs

Enter the discount rate & life of the option

Examples

- Total Capital Cost: £620,000
- Annualised Capital Cost: £53,832
- Annual Avg Operating Cost: £445,000
- Discount Rate: 3.50% (Example: 2.75%)
- Assumed Life of Option: 15 yrs (Example: 25)

Equivalent Annual Cost Factor: 0.09

Present Value Factor: 11.52

Present Value Cost of Option: £5,745,248

Equivalent Annual Cost of Option: £498,832

Comments:

Step 6 pulls together the results of Steps 4 and 5 enabling identification of the Best Available Technique (BAT) or option to secure the desired environmental outcome at reasonable cost.

Environment Agency H1 Database - [Select the Best Available Technique]

File Edit Window Help

Type a question for help

Go To: **Select the Best Available Technique**

Select the Best Available Technique (BAT)

The selection of BAT requires qualitative assessment and expert judgement to balance the costs and environmental benefits. See H1 technical annexes

This assessment should be submitted as a separate document in addition to the summary given in the table below:

Provide justification for the selection of BAT here, or reference to a report in which this judgement can be found:

Number	Title	Environmental Ranking	Cost Ranking	Final Ranking
1	Base-Case	1	1	
2	Improved 1	2	2	
3	Improved 2	3	3	
4	Improved 3	4	4	
5	Improved 4	5	5	

Please specify which option has been selected as BAT:

2

Pages from the tool may be printed off and submitted in support of an EPR permit application. Copies of the .mdb files should be saved and submitted in support of permit applications.